

FURUSE et al., SN 10/085,002  
AF Amdt. dated 2 February 2005  
Reply to final OA dated 2 November 2004

500.41298X00/W0274-01EF  
Page 2

**IN THE CLAIMS:**

1. (Currently Amended) A plasma etching method comprising:
  - placing a sample on a sample stage arranged in a processing chamber;
  - supplying a processing gas toward a center of the sample from a shower plate associated with an electrode arranged in opposed relation to the sample stage, the shower plate having processing gas supply holes and being nearer to the sample stage than provided to a lower surface of the electrode and having processing gas supply holes which is closest to the sample stage;
  - generating plasma in the processing chamber;
  - applying RF power between the sample stage and the electrode for providing energy enabling charged particles in the plasma to enter the sample;
  - neutralizing errant charged particles which enter the processing gas supply holes from the plasma during a period of RF power, by bombardment of the errant charged particles against an inner surface of the processing gas supply holes, the errant charged particles being other than the charged particles that have entered the sample; and
  - etching the sample using the plasma.
2. (Previously Presented) A plasma etching method according to claim 1, wherein the processing gas is supplied toward the center of the sample in such a manner that the shower plate is segmented into a plurality of areas, and the processing gas is supplied in a same direction in each of the segmented areas.

FURUSE et al., SN 10/085,002  
AF Amdt. dated 2 February 2005  
Reply to final OA dated 2 November 2004

500.41298X00/W0274-01EF  
Page 3

3. (Previously Presented) A plasma etching method according to claim 1, wherein an interior of the processing chamber is maintained at a processing pressure of not higher than 10 Pa.

4. (Currently Amended) A plasma etching method for generating plasma in a processing chamber and etching a sample using the plasma, comprising:

supplying a processing gas from a gas chamber formed between an electrode being in opposed relation to the sample, and a shower plate which is arranged nearer in a surface of the electrode closest to the sample, the electrode being in opposed relation to the a sample stage;

maintaining a processing pressure in the processing chamber at not higher than 10 Pa;

generating a plasma in a processing space formed between the sample and the electrode by a plasma generating means;

neutralizing errant charged particles attempting to enter from the plasma to the gas chamber formed between the electrode and the shower plate, by causing the errant charged particles to be impinged upon an inner surface of gas supply holes of the shower plate; and

etching the sample using the charged particles entering the sample from the plasma.

5. (Currently Amended) A plasma etching method for etching a sample under a processing pressure of not higher than 10 Pa, wherein a processing gas is

FURUSE et al., SN 10/085,002  
AF Amdt. dated 2 February 2005  
Reply to final OA dated 2 November 2004

500.41298X00/W0274-01EF  
Page 4

supplied from a position not less than 30 mm and not more than one half of a diameter of the sample in distance from the sample, toward a center of the sample through processing gas supply holes having an inclination angle ( $\theta$ ) to a surface of the sample, smaller than  $\tan^{-1}(t/d)$ , where t is a thickness of the a shower plate, and d is a diameter of a processing gas supply hole.

6. (Previously Presented) A plasma etching method according to claim 1, wherein the bombardment of the errant charged particles against an inner surface of the processing gas supply holes is effected by inclination of the processing gas supply holes to eliminate or reduce an area of a perpendicular path through the shower plate.

7. (Previously Presented) A plasma etching method according to claim 1, wherein the bombardment of the errant charged particles against an inner surface of the processing gas supply holes is effected by having processing gas supply holes formed by a first bore extending inward from a first major planar surface of the shower plate and a second bore extending inward from an opposing major planar surface of the shower plate such that the processing gas can flow between the first bore and second bore, where axes of the first bore and second bore are offset from one another to eliminate or reduce an area of a perpendicular path through the shower plate.

FURUSE et al., SN 10/085,002  
AF Amdt. dated 2 February 2005  
Reply to final OA dated 2 November 2004

500.41298X00/W0274-01EF  
Page 5

8. (Previously Presented) A plasma etching method according to claim 1, wherein the bombardment of the errant charged particles against an inner surface of the processing gas supply holes is effected by application of a biasing magnetic field through the shower plate at least partially parallel to major planar surfaces of the shower plate, to bias travel of the errant charged particles into collision with the inner surface of the processing gas supply holes.

9. (Previously Presented) A plasma etching method according to claim 4, wherein the causing of the errant charged particles to be impinged upon an inner surface of gas supply holes of the shower plate is effected by inclination of the processing gas supply holes to eliminate or reduce an area of a perpendicular path through the shower plate.

10. (Previously Presented) A plasma etching method according to claim 4, wherein the causing of the errant charged particles to be impinged upon an inner surface of gas supply holes of the shower plate is effected by having processing gas supply holes formed by a first bore extending inward from a first major planar surface of the shower plate and a second bore extending inward from an opposing major planar surface of the shower plate such that the processing gas can flow between the first bore and second bore, where axes of the first bore and second bore are offset from one another to eliminate or reduce an area of a perpendicular path through the shower plate.

FURUSE et al., SN 10/085,002  
AF Amdt. dated 2 February 2005  
Reply to final OA dated 2 November 2004

500.41298X00/W0274-01EF  
Page 6

11. (Previously Presented) A plasma etching method according to claim 4, wherein the causing of the errant charged particles to be impinged upon an inner surface of gas supply holes of the shower plate is effected by application of a biasing magnetic field through the shower plate at least partially parallel to major planar surfaces of the shower plate, to bias travel of the errant charged particles into collision with the inner surface of the processing gas supply holes.

12. (Previously Presented) A plasma etching method according to claim 5, wherein inclination of the processing gas supply holes eliminates or reduces an area of a perpendicular path through the shower plate.

13. (Previously Presented) A plasma etching method according to claim 5, wherein other processing gas supply holes are formed by a first bore extending inward from a first major planar surface of the shower plate and a second bore extending inward from an opposing major planar surface of the shower plate such that the processing gas can flow between the first bore and second bore, where axes of the first bore and second bore are offset from one another to eliminate or reduce an area of a perpendicular path through the shower plate.

14. (Previously Presented) A plasma etching method according to claim 5, comprising application of a biasing magnetic field through the shower plate at least partially parallel to major planar surfaces of the shower plate, to bias travel of the

FURUSE et al., SN 10/085,002  
AF Amdt. dated 2 February 2005  
Reply to final OA dated 2 November 2004

500.41298X00/W0274-01EF  
Page 7

errant charged particles into collision with the inner surface of the processing gas supply holes.